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1

TABLET FEEDER

BACKGROUND OF THE INVENTION~~TECHNICAL FIELD~~1. Technical Field

5 [0001] The present invention relates to a tablet feeder and in particular to a tablet feeder featuring a partitioning member that restrains tablets discharged from a pocket portion of a tablet array member.

10 2. Description of Related Art~~BACKGROUND ART~~

[0002] Prior art document information relating to the tablet feeder of the present invention is as follows.

15 [0003] ~~Patent document 1:~~

Japanese patent Laid-open publication H2-205523

~~Patent document 2:~~

Japanese patent Laid-open publication H9-39910

[0004] Japanese patent Laid-open publication H2-205523

discloses a~~In the tablet feeder described in the patent document 1, the tablet feeder is so arranged so~~ that a

20 tablet accommodating section in which a plurality of tablets are accommodated is mounted on a motor base in which a motor is housed, and that a tablet array member disposed in the tablet accommodating section is rotated by the motor so that the tablet can be discharged outside.

25 Specifically~~Concretely~~, on the outer periphery of the

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2

tablet array member accommodated in the tablet
accommodating section, a plurality of pockets are defined
so as to be recessed along the direction of the rotational
axis at specified intervals, so that the tablets in the
5 tablet accommodating section are fed one after another to
the pockets. In the pockets, the tablets vertically
arrayed are partitioned by a partitioning member as the
tablet array member rotates. Thus, the feeder is able~~it is~~
~~enabled~~ to discharge out only the lower side one of the
10 tablets retained in the pocket through a tablet discharge
hole.

[0005] However, in the above tablet feeder, the
partitioning member is made of a thin metal ~~thin~~-plate, and
is disposed at a portion of the outer periphery of the
15 tablet array member. For this reason, although there
~~occursever~~ no problem if the tablets in the pockets are
arrayed properly, ~~yet~~ there are some cases where the
tablets, if they have been caught halfway, are not
partitioned well by the partitioning member. That is,
20 because the partitioning member will go beyond the caught
tablet, the tablet may be sandwiched between the
partitioning member and the tablet array member so that the
tablet may be damaged or chipped, or in some cases, ~~that~~
the partitioning member may be deformed. This would cause
25 a problem in that the tablets could not be discharged

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3

properly through the tablet discharge hole.

[0006] In order to ~~solved~~dissolve the problems, in
Japanese patent Laid-open publication H9-39910~~the patent~~
~~document 2~~above, each partition portion of the
5 partitioning member is formed into a shape of a brush.
Once the brush constituting the partitioning member is bent
due to contact with the tablet, the brush is elastically
returned to the original state, thereby allowing~~enabling to~~
~~smoothly partition~~ the tablets to be smoothly partitioned
10 into upper and lower ~~tablets~~tablet. Thus, the tablets
~~are~~tablet never be damaged, chipped or cracked and the
partitioning member itself does not become damaged~~lead to~~
~~damage~~ even if a tablet has~~the tablet have~~ been caught
halfway in~~ef~~ the pocket.

15 [0007] However, in the tablet feeder described in
Japanese patent Laid-open publication H9-39910~~the patent~~
~~document 2~~, there is ~~a~~the disadvantage that since the
partitioning member is made of resin, the partition
portions ~~having a shape of brush~~can become deformed and, if
20 worst comes to worst, this can lead~~read~~ to damage while
repeating the elastic deformation due to contact with the
tablets. In this case, there is a problem that a large gap
is formed between the brush elements constituting the brush
so that a plurality of tablets drops through the gap,
25 thereby degrading the accuracy of discharging (feeding)

4

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tablets.

SUMMARY DISCLOSURE OF THE INVENTION

~~PROBLEMS TO BE SOLVED BY THE INVENTION~~

5 [0008] The present invention has been developed to substantially eliminate the above-described disadvantages. It is an object of the present invention to provide a tablet feeder that will~~enabling to~~ surely prevent deformation of the brush constituting the partitioning member.

10

~~MEANS TO SOLVE THE PROBLEMS~~

[0009] In order to achieve the aforementioned object, a tablet feeder constructed in accordance with~~of~~ the present invention is provided. The tablet feeder comprises:~~comprising:~~

15

_____ a tablet accommodating section capable of accommodating a multiplicity of tablets;

a tablet array member which is disposed in the

20 tablet accommodating section and which, while being driven and rotated, retains the tablets one after another in pockets defined on an outer periphery thereof and discharges them at a discharge position; and

a partitioning member whose partitioning portion

25 having a shape of brush partitions the pocket so that the

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5

upper tablets do not fall into the lower pocket, thereby the tablets retained in the pocket of the tablet array member are discharged by a predetermined number, the tablet feeder being characterized in that;

5 at least part of brush element among the brush elements constituting the partitioning portion of the partitioning member has a tip bent in a U-shape.

[0010] Preferably, the brush elements constituting the partitioning portion may be tilted toward a downstream side
10 of the rotational direction of the tablet array member.

[0011] Preferably, the brush elements constituting the partitioning portion may have their cross section formed into a generally oval shape, and its minor axis may be directed along the rotational direction of the tablet array
15 member.

[0012] Preferably, the brush elements constituting the partitioning portion may comprise a plurality of filaments which are arranged~~is got~~ together and form~~has~~ a U-shaped
20 tip bent in a U-shape.

20

~~EFFECT OF THE INVENTION~~

[0013] In the tablet feeder of the present invention, as the partitioning portion is formed in a shape of a brush, the partitioning portion, after once bent under contact
25 with the tablets, can partition the tablets into a

predetermined number of tablets without any difficulty. Accordingly, there is no possibility that the tablets may be damaged, chipped, or cracked. Also, as at least part of
5 | the brush element among the brush elements constituting the partitioning portion of the partitioning member which restrains tablets so as to be discharged by a predetermined number has a tip bent in a U-shape, it is possible to increase an elastic restoring force when the brush element is deflected due to contact with the tablet and released
10 | from the pressure. Therefore, it is prevented that the brush is plastically~~elastic~~ deformed into a partly deformed state as it is used.

[0014] In addition, as the brush constituting the partitioning member are tilted toward the downstream of the
15 | rotational direction of the tablet array member, or the brush is formed into a generally oval shape with its minor axis directed along the rotational direction of the tablet array member, the brush will make contact with the tablets and be elastically deformed smoothly in a certain direction,
20 | so that the tablets can be separated more appropriately.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 is a sectional view of a tablet feeder according to the present invention;

25 | FIG. 2 is an enlarged partial bottom view of

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7

tablet accommodating section of FIG. 1;

FIGS. 3A, 3B are perspective views of the partitioning member to be used in the tablet feeder and FIG. 3C is a sectional view of FIG. 3A along C-C line;

5 | FIG. 4 is a plane~~plane~~ view showing a state in which the tablets located in a pocket of the tablet array member are partitioned by the partitioning member;

FIG. 5 is a front view showing a tablet feeder of another arrangement;

10 | FIG. 6 is a front view showing a tablet feeder of still another arrangement;

FIG. 7 is a perspective view showing a construction~~constitution~~ of another partitioning member;

15 | FIG. 8 is a perspective view showing a construction~~constitution~~ of still another partitioning member; and

FIG. 9A is a perspective view showing a construction~~constitution~~ of still another partitioning member and FIG. 9B is an enlarged perspective view of its
20 | substantial part.

| EXPLANATION OF REFERENCE NUMERALS

	[0016]	4	tablet accommodating section
		6	tablet discharge hole
25		8	tablet array member

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8

11 pocket
13 partitioning member
14 partitioning portion
15a, 15b brush element
5 16 fixing portion
A tablet

DETAILED DESCRIPTION OF BEST MODE FOR CARRYING OUT THE
INVENTION

10 [0017] Embodiments of the present invention will be described hereinafter.

[0018] FIG. 1 shows a tablet feeder according to an embodiment of the present invention. This tablet feeder generally comprises a motor base 1 and a tablet
15 accommodating section 4 provided above the motor base 1. In the motor base 1, a motor 2 is contained and a discharge path 3 for discharging tablets A out is provided on back side. The tablet accommodating section 4 has a bottom
20 surface formed into a generally conical shape with the cross sectional area gradually decreasing downward, and a cylindrical boss 5 is provided in the center of the bottom surface so as to protrude upward. In proximity to the
outer periphery of the boss 5, a tablet discharge hole 6 is bored so as to communicate with the discharge path 3. This
25 tablet discharge hole 6 has at least such a size that one

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9

of the tablets A accommodated in pockets 11 of the tablet array member 8, as will be described below, are allowed to drop. Also, the accommodating section 4 has slits 7 formed by the upper inner edge of the tablet discharge hole 6 being cut out circumferentially, as shown in FIG. 2.

[0019] In the center of the bottom surface of the tablet accommodating section 4, a tablet array member 8 is disposed rotatably about the boss 5. The tablet array member 8 has a circular shape, its lower surface being formed into a generally conical shape that corresponds to the shape of the bottom surface of the tablet accommodating section 4 and its upper surface also being formed~~swollen~~
~~also~~ into a conical shape. In the center of the lower surface of the tablet array member 8, a swivel 9, which is received in~~fits to~~ the boss 5, is protrudingly provided. A gear 10, attached at the lower end of the swivel 9, is engaged with ~~an unshown~~ gear (not shown) provided on~~te~~ a rotating shaft 2a of the motor 2, by which rotating force of the motor 2 is transferred to the tablet array member 8. On the lower surface of the tablet array member 8, a plurality of pockets 11 are formed at equal angles to the circumferential direction, each pocket 11 having~~hashaving~~ such a size that two pieces of tablets A arrayed longitudinally one-by-one~~one by one~~ can be accommodated therein. Between adjacent pockets 11, a thin-width recess 12 is defined

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10

circumferentially on a site corresponding to an intermediate position of the tablets A accommodated in each pocket 11.

5 [0020] On the bottom outer surface of the tablet accommodating section 4, a partitioning member 13 is fixed.

10 | ~~The~~This partitioning member 13 is made of a synthetic resin material such as polyacetal, and comprises a partitioning portion 14 and a fixing portion 16 as shown in FIGS. 3A and 3A₁, 3B. The partitioning portion 14 has generally a shape of a brush 9 (or comb) and is tilted toward the downstream in the rotational direction of the tablet array member 8. Among a plurality of brush elements 15a, 15b having elasticity and constituting the brush of the partitioning portion 14, most of the brush elements 15a

15 | positioned at the middle of the partitioning portion 14 have a linear shape with a tip bent in a U-shape. The brush elements 15b positioned at both ends of the partitioning portion 14 ~~have~~has a linear shape extending like a straight line. In a state in which~~that~~ the

20 | partitioning member 13 is attached to the tablet accommodating portion 14, the partitioning portion 14 is projecting into the tablet accommodating section 4 via the slits 7 defined in the bottom surface of the tablet accommodating section 4 so that the tablets ~~A₁~~A retained

25 | in the pocket 11 of the tablet array member 8 are divided

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11

into the ~~lowermost~~~~lower most~~~~one~~ tablet A and the upper
tablets A. Each of the brush elements 15a, 15b has a cross
section formed into a generally oval shape as shown in FIG.
3C, and the elements are arrayed along ~~the~~~~its~~ minor
5 axes~~axis~~ thereof at a predetermined interval. Thus, with
the partitioning member 13 mounted to the tablet
accommodating section 4, each of the brush elements 15a,
15b will easily be elastically deformed only along the
direction of the minor axis, i.e., toward the downstream of
10 the rotational direction of the tablet array member 8. The
tips of the brush elements 15a, 15b are arranged in a
circular arc shape along the outer cylindrical surface of
the tablet array member 8.

[0021] The tablet feeder with the
15 construction~~constitution~~ described above is used to take
out the tablets A accommodated in the tablet accommodating
section 4 ~~one-by-one~~~~one-by-one~~ (one in this embodiment, but
2 or more are possible). More specifically, the tablets A
accommodated in the tablet accommodating section 4 are
20 retained in each of the pockets 11 of the tablet array
member 8 in such a state that two tablets A are arrayed and
directed downward. In this state, upon rotation of~~with the~~
tablet array member 8~~rotated~~, the partitioning portion 14
of the partitioning member 13 enters between the two
25 tablets A~~, A~~ of each pocket 11 along with the rotation.

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12

The partitioning portion 14 is composed of a plurality of brush elements 15a, 15b projecting obliquely, and each of the brush elements 15a, 15b is projecting obliquely toward the downstream of the rotational direction of the tablet array member 8. Therefore, the brush element 15b located most upstream with respect to ~~of~~ the rotational direction of the tablet array member 8 first makes contact with a tablet A. The brush elements 15a, 15b, which are all projecting in the same direction, are gradually bent under press contact with the tablet A as the tablet array member 8 rotates, and the brush elements are thus being ~~are thus being~~ elastically deformed smoothly, as shown in FIG. 4. In this way, the number of brush elements 15a, 15b which are elastically deformed is increased so that the pressing force of ~~the~~ the tablets A increases gradually. Thus, the tablets A within the pockets 11 are divided into a single lower one ~~one~~ tablet and upper tablets A without any difficulty, and restraining ~~and restraining~~ the upper tablets A are restrained ~~tablet A~~ from falling into the lower pocket 11. Accordingly, there will never occur flaws or cracks will never occur in ~~there will never occur~~ to the tablets A. Also, even if a tablet A is ~~has~~ caught halfway in ~~in~~ the pocket 11 such that the partitioning portion 14 of the partitioning member 13 passes the intermediate portion of the tablet A, the brush elements 15a, 15b will be elastically deformed so that flaws or cracks of the tablet

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13

A will never occur ~~to the tablet A~~, and breakage of ~~that~~ the partitioning member 13 will never occur ~~lead to breakage~~.

[0022] Also, in the present embodiment, the brush element 15a constituting the intermediate brush of the partitioning portion 14 has a tip formed in a U-shape, it is possible to increase an elastic restoring force when the brush element is deflected due to contact with the tablet and released from the pressure. Therefore, ~~it is prevented that the brush is~~ prevented from being plastically deformed ~~plastic deformed into a partly deformed state~~ as it is used.

[0023] The tablet feeder of the present invention is not limited to the construction ~~constitution~~ of the above embodiment but may be changed in various ways.

[0024] For example, the above embodiment has been described ~~in~~ in a case in which the partitioning member 13 according to the present invention is applied to a tablet feeder having pockets 11 defined in the lower surface of the conical tablet array member 8. However, it may also be applied, of course, to such tablet feeders as shown in FIGS. 5 and 6.

[0025] Specifically ~~Concretely~~, in the tablet feeder as shown in FIG. 5, a columnar tablet array member 8 is rotatably accommodated in a cylindrical tablet accommodating section 4, and a plurality of pockets 11 are defined on the cylindrical surface of the tablet array

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member 8 so as to extend in a vertical direction. In this tablet feeder, in which the tablets A are arrayed in a line along the vertical direction within the pockets 11, the tablets A can be divided by using the partitioning member
5 | 13 without causing flaws or cracks into the tablets A as in the foregoing embodiment, where the partitioning member 13 itself also will never lead to breakage.

[0026] In the tablet feeder as shown in FIG. 6, a columnar tablet array member 8 is rotatably accommodated in
10 | a cylindrical tablet accommodating section 4, and has at its top end a tilted surface 8a, where a pocket 11 is provided only at one place, the lowermost place of the tilted surface 8a. Tablets A accommodated in the tablet accommodating section 4 are introduced to the pocket 11 by
15 | the tilted surface 8a, and thereafter, upon reaching a discharge position, they are divided by the partitioning member 13 so that the upper tablets A do not fall into the lower pocket 11. This tablet feeder can also ~~can~~ produce the same effects as the foregoing embodiments by virtue of
20 | the partitioning member 13.

[0027] The pocket 11 does not always retain more than 2 tablets A but may retain only one tablet A.

[0028] Also, the partitioning member 13 used in each of the aforementioned tablet feeders is not limited to the
25 | above construction. For example, as shown in FIG. 7, the

brush elements 15a, 15b may be formed so that the protrusion dimension becomes reduced in accordance with the distance to the outer cylindrical surface of the tablet array member 8. In the aforementioned embodiment, the partitioning portion 14 is formed so as to protrude from the both sides of the fixing portion 16, though the partitioning portion 14 may be formed so as to protrude from one ~~sidesides~~ of the fixing portion 16. The construction of the fixing portion 16 ~~itself~~ may be changed in various ways in accordance with the construction of each tablet feeder.

[0029] In the aforementioned embodiments, the brush elements 15a having the U-shaped tip ~~tip of U-shape~~ are provided at the intermediate portion of the partitioning portion 14 and the brush elements 15b having a linear shape are provided at the both sides of the partitioning portion 14, though all brush elements may be formed by the brush elements 15a having the U-shaped tips ~~tip of U-shape~~.

[0030] In the aforementioned embodiments, each of the brush elements 15a, 15b of the partitioning portion 14 is constituted by single linear member, though the brush element may be constituted by a bundle of filaments, i.e., a plurality of filaments 17 which are held ~~is get~~ together as shown in FIGS. 9A, 9B. In particular ~~Concretely~~, the brush elements 15a of the partitioning portion 14 may be

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16

5 | formed of a plurality of filaments 17 which are held~~is get~~
| together and form~~has~~ a tip bent in a U-shape. Thus, as the
| cross sectional area of each filament becomes reduced, it
| is possible to further eliminate the problem of~~a problem~~
| ~~that~~ the tablet A being~~is~~ damaged and the problem of~~a~~
| ~~problem that~~ the brush, constituting the partitioning
| portion 14, being~~is~~ deformed.

19

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ABSTRACT

5 A tablet feeder ~~including~~comprising a tablet
accommodating section (4) capable of accommodating a
multiplicity of tablets A; a tablet array member (8) which
10 is disposed in the tablet accommodating section (4) and
which, while being driven and rotated, retains the tablets
A one after another in pockets (11) ~~formed in~~defined on an
outer periphery thereof and discharges ~~the tablets~~them at a
discharge position; and a partitioning member (13) whose
15 partitioning portion (14) having a shape of a brush
partitions the pocket (11) so that the upper tablets A do
not fall into the lower pocket (11). ~~pocket 11,~~
~~thereby~~Thereby, the tablets A that are retained in the
20 pocket (11) of the tablet array member (8) are discharged
~~in by~~by a predetermined ~~number~~number, ~~the~~The partitioning
member (13) includes a plurality of brush elements (15a,
15b) constituting a partitioning portion (14). ~~At tablet~~
~~feeder being characterized in that, at least part of the~~
25 ~~brush element~~element (15a) ~~among the brush elements 15a,~~
~~15b constituting the partitioning portion 14 of the~~
~~partitioning member 13 has~~each has a tip that is bent in a
U-shape. Thus, deformation of the brush ~~element~~element
(15a), constituting the partitioning member (13), can be
surely prevented.